

REMARKS

This Amendment and Response is believed to be responsive to the Office Action mailed September 28, 2005. In that action: claims 1-6 and 21 were rejected under 35 USC 103(a) as anticipated by Pettitt (USPN 6,256,073); claims 7-17 and 20 were noted as allowable; and claims 18 and 19 were objected to as dependent on a rejected base claim but allowable if properly amended into dependent form.

Claims 1 and 2 are amended to further clarify the distinctions over the prior art of record. Reconsideration of the rejected claims is hereby requested. New claim 22 is added and is believed to be patentable because it is a system claim having substantially the same limitations as allowed method claim 7. New dependent claim 23 depends from claim 22 and is believed to be patentable for the same reason and because of the additional limitation therein. Reconsideration of the rejected claims and allowance of the new claims is hereby requested.

Each of the rejected claims has been rejected based on Pettitt, which discloses a display system using a color wheel. Specifically, Pettit is directed to binning the color segments of a color wheel into high-efficiency and low-efficiency groups and then selecting segments from those groups to assemble color wheels in order to assure that the light efficiency of each assembled color wheel exceeds a minimum threshold. The particular efficiency Pettitt is referring to is the ratio of the light (measured in lumens) passing through the color wheel to the light available from the light source (Pettitt at col. 4, lines 19-53).

The examiner has cited the following passage from Pettitt at col. 6, lines 16-24 that is apparently believed to sound similar to the claimed invention: “[t]herefore a method of optimizing the fabrication of a color wheel is needed that will closely control the overall white efficiency variance of the completed color wheels without degrading the display system's color

purity or substantially increasing the cost of the color wheel. The same need arises when matching color sources, whether light sources, color filters, or beam splitters, that exhibit unit-to-unit variances.” To better understand those sentences and Pettitt’s disclosure, the examiner is requested to read the subsequent three paragraphs (col. 6, lines 24-60).

In particular, “[i]n practice, implementing the selection method requires characterizing each filter tested and grouping, or binning, the filter based on its performance characteristics at the component test manufacturing level. During the system build cycle, filters are chosen from groups or bins chosen to ensure compatibility with the other filters combined into a given system.” Col. 6, lines 37-43. “The groups into which the filters are placed are determined such that a minimally efficient blue filter, coupled with a minimally efficient filter from a second color, either red or green, coupled with a minimally efficient filter from the high efficiency group of the third color, either green or red, will meet or exceed the minimum efficiency requirements of the color wheel. That is, sorting the filters into these filter groups, or bins, and never matching two filters from the green and red low efficiency groups 704 and 804, prevents building color wheels which will not meet the color wheel efficiency specification.” Col. 6, lines 50-60.

As can be seen, Pettitt seeks to minimize the variance in efficiency from one assembled color wheel to another assembled color wheel, by assuring that they never match a low-efficiency green color segment with a low-efficiency red color segment.

Claim 1, on the other hand, defines a color sequencing system with a color wheel having four segments, with a fourth segment being broadly transmissive across the wavelength spectrum of visible light while the broadly-transmissive segment has a transmittance at some wavelengths of visible light that is different from a transmittance at some other wavelengths of visible light. Pettitt’s only disclosure of a segment that is broadly transmissive across the visible light

spectrum is when he briefly mentions at col. 5, lines 15-17 that “[a]lternatively, a fourth segment is used to transmit white light. The white light is used to increase image brightness.” There is no other detailed discussion of the characteristics of such a segment. There is certainly no teaching or suggestion in Pettitt of the fourth segment having a transmittance that is different at some wavelengths of visible light than at some other wavelengths of visible light. This is because Pettitt is attempting to minimize variances from assembled unit to another assembled unit, while the present invention is directed to improve efficiency and provide a desired color of light transmitted through the fourth segment of the color wheel.

Purely by way of example, consider a color wheel that is used with a light source such as an arc lamp. Arc lamps may have an emittance characteristic with a strong peak in the yellow region. A color wheel could be employed with a fourth segment that is broadly transmissive and has a notch in the yellow region; e.g. the transmittance of the segment may be nearly unity at all wavelengths except for a narrow band of wavelengths in the yellow portion of the spectrum where the segment transmittance is rather lower than unity. This would meet the claim 1 limitation of having a transmittance at some wavelengths that is different than at other wavelengths. The segment of this example would not be white as taught by Pettitt, but would appear bluish when viewed with light from a natural spectrum such as sunlight. The light from an arc lamp having an emittance peak in the yellow that passes through this exemplary fourth segment would, however, have a smoother or more uniform intensity across the wavelength spectrum, since the transmittance notch in the fourth segment compensates for the peak in the emittance characteristics of the arc lamp.

For all of the above reasons, it is respectfully submitted that claim 1 and dependent claims 2-6, 18, and 19 are patentable. Further, claim 2 is patentable for the additional reason that

transmittance of the broadly-transmissive segment is selected to provide a light output that is substantially uniform across the wavelength spectrum of visible light after the light from the light source has passed through the broadly-transmissive segment. Claim 3 is even further patentable because the spectral transmittance of the broadly-transmissive segment is substantially the inverse of the spectral light output from the light source. Claim 4 is further patentable because the spectral transmittance of the broadly-transmissive segment is attenuated in some portion of the wavelength spectrum of visible light. Claim 5 is further patentable because the spectral transmittance of the broadly-transmissive segment is notched in some portion of the wavelength spectrum of visible light. Pettitt does not teach or suggest any of these limitations.


Independent claim 21 is patentable for similar reasons in that the fourth segment in claim 21 is transmissive of non-uniform amounts of red, green, and blue light so as to provide a desired color of light transmitted therethrough.

The applicants would like to conduct a telephone interview with the Examiner, at a time convenient to the Examiner, once this amendment has reached the Examiner's desk and during the time period when the Examiner is most likely to be working on this case. If the Examiner would telephone the undersigned at 720-562-5506, we can arrange for a suitable time.

Hopefully, we can include the Chief Scientist for the assignee in the telephone interview as well.

Respectfully submitted,

MARSH FISCHMANN & BREYFOGLE LLP

By: 

Robert G. Crouch
Registration No. 34,806
3151 South Vaughn Way, Suite 411
Aurora, Colorado 80014
(720) 562-5506

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